

## 17.

## Notes on the Breeding of the Empress of Germany's Bird of Paradise in Captivity.

PRINCE K. S. DHARMAKUMARSINHJI OF BHAVNAGAR.

(Plate I).

## Foreword by Jean Delacour.

Birds of Paradise have exerted a strange fascination ever since men have known them. This is not surprising, as their beauty and showiness cannot be surpassed. They have been eagerly sought by aviculturists, as well for public zoological gardens as for private aviaries.

Nearly all the many different species have been obtained from their native haunts in and around New Guinea and kept in Europe, in America, in India and elsewhere. So far, however, none had ever been bred in confinement. Eggs had been laid, and as recently as the last two years the pair of Long-tailed Birds of Paradise in the New York Zoological Park have nested repeatedly, but no further results followed.

Prince Dharmakumarsinhji is the first aviculturist to have met with complete success. A young Empress of Germany's Bird of Paradise has been reared in his aviary. He must be heartily congratulated for such an achievement, more so for having noted so carefully all the observations he has made on this outstanding event.

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On receiving a telegram from Mr. Shaw Mayer, in May, 1939, to the effect that he was passing through Bombay on his way to England with a collection of tropical birds, including many species of Birds of Paradise, I wired to my friend, the Inspector of Aviaries of His Highness the Maharaja Sahib of Bhavnagar, to go to Bombay. I was then at Mussoorie recovering from ill-health; had I been well I could not have resisted seeing this marvellous collection of oriental birds as it passed through India. Within a few days I was informed that the Inspector had bought a pair of *Paradisea apoda augustae-victoriae* and a male of the Lesser Superb Bird of Paradise (*Lophorina superba minor*) and that they were on their way home to Bhavnagar.

On arrival the pair was set free in His Highness' Palace aviary in a suitable cage

facing west, the cage having an interior room higher up if they required more seclusion. The roofing was of tiles with a good 45-degree slope. Below the tiles was wood. Surrounding the aviaries were large trees so that the cages kept cool during the heat of the day. Moreover, the evening sun could only penetrate at a late hour. This environment evidently suited them very well.

In the season during which the birds arrived, they began moulting rapidly, and there was nothing specially interesting except that they slowly became accustomed to the special diet that is given to our Indian birds, which I shall later mention.

The following spring, at the beginning of February, 1940, the male bird showed signs of display and started calling vigorously. The call is a harsh *wauk wauk wauk wauk wauk* continued, as described by different ornithologists concerning the Greater Bird of Paradise. This call is repeated often during the day and is the general call; there are many others that the bird emits. As the hot weather approached, the male was seen displaying. My assistant, the Aviary Inspector in whose charge I had entrusted the birds, mentions that he saw the male displaying as follows: "He lowered his head, drooped his wings and erected his plumes above his back. Sometimes the plumes were not completely erected, however. All this could be seen through the first cage. I had a glimpse of him while he was moving from side to side, hopping on his favorite perch—a horizontal piece of straight wood one inch thick, and three feet long."

I was unfortunately not able to witness the full display as described by my assistant.

Suddenly during the next month, April, 1940, the male commenced shedding his beautiful plumes and to my astonishment they were all discarded within a fortnight. It was then that we noticed that he showed signs of real courting, chasing the female and calling in tones which varied from gurgles to grunts. It was his custom to lower

his head at the same time, emitting short grunts as he approached the female. These gestures appeared to be his true courting. The particular grunt that he emitted then resembled the sound of a motor-bicycle horn. The courting took place in the early hours of the morning and after the new food was put in the cage, which was at 10 A.M., and also during the quiet hours of the afternoon.

During the middle of April the female was seen picking up nesting material. Hence an old crow's nest was put on a branch erected inside the cage. Twelve days later the female had constructed a cup-shaped nest of coconut fibres and new leaf stems inside the crow's nest and we found that she had started incubation of a single egg.

The hen bird was very regular, sitting tighter as the days advanced, leaving the nest two to three times a day and only coming down to feed, refresh herself and preen her feathers.

After the 25th day of incubation the hen bird became very irregular and on the 28th day I could not resist seeing the egg again and examining it. Most unfortunately, the egg was found to be infertile. I now have it in my collection; its measurements are: length, 3.65 cm.; middle 2.65 cm.

During the month of November, 1941, I moved into my own house, Dil-Bahar, where I had special aviaries constructed to suit my birds and where I took over the pair of Birds of Paradise. Here I devoted most of my time to making notes at the commencement of the breeding season. Out of the four cages facing east, the second from the south I selected for the pair. All of the cages were of equal size but the interior was colored differently and there was no extra room as in the palace aviaries. The two middle cages are closed in on three sides with net windows and have a venetian type of window at the back of the wall for ventilation. The front is wire netting with a door for each cage. The cage in which the Birds of Paradise were kept (cage No. 2) is furnished with plants (crotons), dry perches of teak wood laid horizontally, and an old stump of a tree with branches put here and there. A cemented water course passes through all the aviaries to supply fresh running water for drinking and bathing.

The food of the birds has been virtually unchanged since they came into my aviaries. It consists of papaya, bananas and chogo, which latter is a mixture of flour, eggs, meat and ghee made out of butter. Live food is also given, including grasshoppers, mole-cricket and locusts. I find that the birds relish this mixed diet and thrive on it. The breeding of my pair would indicate an adequate diet.

Throughout the winter months the male

was calling, although not as vigorously as in February and March. The diversity of calls that he emitted was extraordinary, varying in strength in different degrees and rather difficult to describe. Nevertheless I was able to notice that the male had definitely a peculiar call during the real courtship or rather during the height of love-making. This call was a short syllabled, horn-like sound as mentioned before. There was also another peculiar call that seemed similar to that of our Indian tree-pie; this also was heard only during the breeding season. The former love call is generally emitted at the approach of the female or when close to her. Moreover, it was the male's daily habit to bow his head from side to side, then suddenly jerking it up like a mallard drake and shaking it in pride.

During the entire month of March, the male bird was calling incessantly throughout the day but no special display was to be seen except at the end of the month when he was heard emitting his peculiar courtship grunts. At this time both birds were very shy, especially the female which had a very acute sense of danger and vigilant eyesight. The latter was indicated when I was in the habit of looking from the adjoining aviary (No. 3) to see if I could catch the male displaying or luckily happen to see them mating. In order to do so I had drilled two small holes through the cement sheeting on the sides of the aviary. The two holes were three feet apart and the size of a 22 calibre rifle bullet hole. From here I could observe from time to time the male coming down to feed, taking his daily bath in the early morning and dancing about on the branches. After taking his dip he would dry himself on his perch, preening his beautiful plumes. The hen bird would also bathe but not so regularly as the male. This may have been because she could perceive me through that minute hole and catch any slight movement that I made. She was very wary and became more suspicious toward the direction of the holes. However, it does not seem unusual among these birds to be suspicious, for in the dense jungles of New Guinea there must be many of their enemies lurking close by. Moreover, they are birds that normally prefer absolute seclusion among dense foliage.

While the male had his own courtship and display, I noticed also that the female seemed very active. She would exercise in a peculiar manner which coincided with the display of the male. She would leave her perch, fly toward the open side of the cage and make one or two short circles and return. At first I imagined this to be merely the usual exercise. But making further observations I noticed that it was a part of the pro-breeding display, if one may call



it so. She would sometime fly around the male in this manner, too. This latter behavior overcame my doubt.

The female Bird of Paradise had a habit of moving from one side to the other on a branch, often turning completely round and flipping her wings as do crows. This behavior of wheeling, as I might call it, is also to be seen among babblers. They are very cautious birds and do not alight on the ground if they can help it. This characteristic is so pronounced that they will climb down a branch, lower the head, take a drink, go up again and fly to their perch. When coming down to feed they will fly to a slender branch of a bush, alighting invariably in a horizontal fashion. Then they wheel about as they climb down with one foot above the other, see that there is no danger, and then come down to feed. I have seen the female scale an old trunk of a tree not unlike a woodpecker looking into the crannies for insects.

During April, although the climate became a little warmer as the southeast winds began to blow, there was a cool breeze coming from over the sea. This seemed to stimulate the birds immensely. The male started his displays. Hopping on his branch, with both feet simultaneously, he would jump up one or two inches, as it seemed; in springing himself up he would also move his wings rapidly. Then he would fly to another branch, do the same and return. He would also hop from side to side on his favorite perch, lowering his head from one side to the other and making his courtship grunts. This kind of display lasted fifteen days from April 5 to April 20. During the second week of April, after the 17th, the hen bird was for the first time seen picking up a stem of lucerne in her beak and carrying it towards nest No. 2, an old crow's nest composed of bits of wire, which had been placed in the northeast corner of the aviary about a month before.

This was the first sign of nest building. The southeast winds continued.

On April 21 the male was not calling as much as usual. The next day I arranged to put creepers, lucerne and fibers for nesting material into the aviary. New material was given each day but the female preferred the lucerne, flying to nest No. 2 and depositing the succulent stems untidily. Many of them dropped out of the nest, while some were not even properly arranged. The building procedure continued every day but only in the morning hours between 9 and 10:30 o'clock. Some creepers fell down each day while new ones were roughly put on the nest. As the days advanced only a few remained on the nest. This type of haphazard nest building went on until April 27 when everything ceased and there were no signs of picking up of material. By this time only

a few stems of lucerne, that had fixed themselves in the wire nest, remained. Whether the hen bird had become suspicious or whether she was bluffing was a question to be answered later. However, I kept a close watch and found that the male bird was again calling vigorously and was seen chasing the female.

On May 6 I was spraying water with my hose pipe into the cages because of the tremendous heat. It was my habit to spray the casuarina branches that screened part of the south and west walls at the back of the aviary. I did not notice the hen bird move as she regularly did from behind the screen. However, a few minutes later when I had stopped spraying, she flew out of the casuarinas and she perched on a branch in the front part of the cage. She immediately started drying herself, and having done so at once flew back to her usual resting place. In spite of this new observation, which I then took to be quite natural, I passed the cage to water the others.

Two days later, on May 8, my aviary boy reported the nest and a single egg of the Paradise Birds among the casuarina branches. His suspicion had been aroused because the hen bird was not to be seen in the cage and on investigating in the casuarina screen, he eventually flushed the bird off the nest. I confirmed his statement by seeing the egg by means of a small mirror fastened to a cane stick. The nest was a regular cup shape and was placed between the stems of the thickest clump of branches. It was quite invisible from outside. A glimpse of the hen bird could be seen from the adjoining aviary but only if the place were pointed out to one. Such was the cunning of the female which had ingeniously avoided our attentions and had surreptitiously built her nest. From May 8 I took particular care and put down my notes.

The hen bird would come down from the nest to feed and clean herself three or four times a day and would remain out from five to ten minutes on each occasion. The male kept fairly silent and never interfered, only making his grunts and gurgles when the hen left her nest. I could generally tell when the female had left the nest by the male making his love calls. On May 17 and 18 the hen was very hard set. On May 20 one of my female dayal birds got into the cage and caused a little trouble before I could remove her. Actually I opened the first cage window so that she could return but I found by doing so a pair of spreo starlings entered the cage, too. However, I managed to entice them out except for a spreo which was so obstinate as not to leave the cage.

The next day, May 21, at 2 P.M., I found near the front of the cage an empty egg shell which I at once recognized as that of

the Bird of Paradise. The first thought that gripped me was that the spreo starling had done the mischief, for often they have swallowed and destroyed the eggs of other birds. The next instant I was in the cage with my mirror to examine the nest and to my delight I saw a little chick, an absolutely pink little thing lying on its side. At once I had the spreo removed. Counting the days from May 8, the incubation period evidently was 13 days, but I am inclined to think that the egg was laid earlier—probably on May 6, so that the incubation period would be 15 days. However, this is a point to be confirmed when better chances afford.

The hen brooded the chick most of the time and started feeding it, as I noticed, at midday. The feeding procedure was extremely interesting. Grasshoppers were put down. She would select one, 1 or 2 inches long, take it to a near branch, then fix it in her claws and start removing its legs, then its wings, and finally would swallow it whole. Seeing that there was no danger, she would fly to the nest and regurgitate the food into the mouth of the young.

After four days the hen bird would take two grasshoppers at a time and regurgitate them both into the mouth of the nestling, one by one. During the next week large grasshoppers were given as well as locusts. These the hen apparently preferred to the smaller ones. In this case also she would take a locust or large grasshopper and proceed with it in the usual manner, removing the legs and wings and also the intestines. The latter were cleverly removed. Then piece by piece she would swallow the soft abdomen and lastly the head, which evidently was an edible portion of the body. However, there was one special peculiarity that I marked about the parent bird during the feeding; that was that she fed the young only twice at each feeding time. This seemed to me very strange. However, when the nestling was 10 days old she would take two or three small grasshoppers and swallow them entire at a time, and would regurgitate them out one by one. She would only bother herself to remove the legs and wings in the case of larger insects. After each feeding the hen picked up the excreta of the chick, which she swallowed in the manner of many other birds during their parental care.

During the first week, I started with only three feedings, one at 9 A.M., the second at noon and the third at 4 P.M. During the second week I increased the feedings to five, at 7:30 and 11 A.M., 2, 4 and 6 P.M. and continued the same until the young left the nest. The number of insects varied at each feeding. When large insects were given the number was usually small—thus, five or six large insects or as many as twenty small ones.

The voice of the chick could be heard at a distance of 10 feet when it was one week old and at 15 days the chattering was audible at 30 feet.

The temperature in the shade of June 3 registered 110 F. This was at the hottest part of the day. The heat was intense, especially on the roof and inside, despite two layers of cement sheeting with a one-inch air space. On Friday June 5, there was a distressing scene, the nestling falling to the ground. Fortunately it escaped injury. Why it should have fallen seemed a mystery, but I later concluded that it was a result of activity induced by the extreme heat and the lack of ventilation near the nest.

At the end of the first fortnight the tender wing feathers were clearly visible, the pectorals were merely hairs, and the tail feathers were starting to grow. The nestling was handled with care and was returned to the nest. It croaked once or twice while on the hand. The legs were still colorless and white. The iris of the eye was lead gray. During this period of intense heat the nestling fell out of the nest again, but since there was straw on the ground, it did not sustain injury and was returned to the nest.

On June 8, 10 and 12 I took photographs of the parent bird feeding the nestling.

After June 10 the temperature dropped and it varied from 105 to 107 degrees F.

The male bird took no part in parental care, but on the contrary became quite a nuisance at times. In fact, he seemed rather henpecked. The female would fly at him and claw him if he ventured too near the nest. The male became sluggish, and would sit placidly in his usual perch in the corner opposite the nest. He was removed as the young got older, as a safety measure.

To give a more detailed description of the nest, it was cup-shaped and measured  $4\frac{1}{4}$  inches wide and  $3\frac{1}{2}$  inches deep. It was composed mostly of causerina leaves and creepers of *Jacaramontsia*, which has a beautiful blue flower. There were, however, a few coconut fibres. The height from the ground was 7 ft. 4 in. and the nest was situated in the southwest corner of the cage.

On June 21 the nestling was able to fly out of the nest. It was fully fledged and looked very much like its mother except that the nape was not so lightly colored as in the parent bird. The eyes were different and the legs lighter in color. It would fly behind its mother for food, and slowly started to feed on its own.

During the entire period of parental care the hen bird emitted a call that I had not previously noted. It was an alarm call, sounding like *Kurr Kurr Kurr*, resembling the call of some of the larger woodpeckers. This call was only heard during the period of parental care and was quite different from the call the female ordinarily emitted.



Her call does not vary as much as that of the male, but is shriller.

[On April 28, 1943, Prince Dharmakumarsinhji wrote Dr. A. Wetmore, of the Smithsonian Institution, as follows]:

"My adult male *Paradisea apoda augustae* suddenly died on February 17, although a week before he was seen courting and I had every hope that the pair would breed successfully again.

"I had been surprised when my cage boy reported that the adult hen was showing signs of nest building. This was on March 7. The situation of the nest this time was in the adjacent corner or N. W. direction of the aviary among the casuarina branches. I promptly inspected the place and could not ascertain it as a nest, although I had seen the hen bird sitting there quite often and breaking leaves. Ten days later nest building commenced in the usual slow manner on a dried bush of a *Duranta* situated in the

front part of the aviary. Creepers with their blue flowers hanging on their stems were placed on the bush each day until active nest building took place on March 20 and 21 and a complete cup-shaped nest was built. Moreover, on March 22 the hen started incubating a single egg. The nest was composed of creeper and pieces of coconut fibre with a bit of string and was lined inside with casuarina leaves. The height from the ground was 3 feet 7 inches.

"Incubation was very regular. She would not stir even when the cage boy went in regularly to clean the cage and put down the food. On April 14 I took the egg, which I believe was addled, while it was still being incubated most regularly. For the next few days the adult hen bird could be seen perched on the nest with a mournful air. After that she began destroying the nest completely. Let me hope that the young bird of her previous nesting will turn out to be a male."

## EXPLANATION OF THE PLATE.

## PLATE I.

Fig. 1. Female Empress of Germany's Bird of  
Paradise on her nest in the aviary.

Fig. 2. Female feeding the nestling.